

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27549

42ND AVENUE

OVER THE

MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 17A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete substructure units inspected at Bridge 27549, Piers 9 and 10, were generally in good condition with no structurally significant defects observed. The footing at Pier 9 was exposed around the entire perimeter with up to 2.5 feet of vertical face exposure along the east side. Light to moderate timber debris was observed at the upstream nose of both piers and along the east side of Pier 9. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

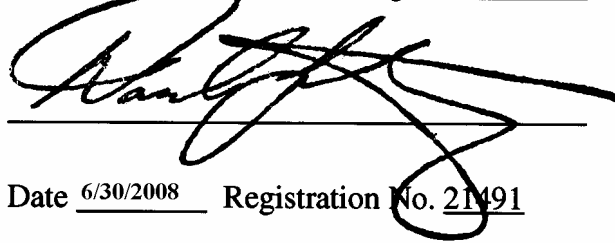
- (A) The top of the footing around the entire perimeter of Pier 9 was exposed with vertical face exposures of 1 foot at the upstream west corner, 4 inches at the downstream west corner, and a maximum of 2.5 feet along the east face. Exposures were comparable to those noted during last inspection.
- (B) Timber debris, consisting of logs 18 inches in diameter and smaller, was observed along the east side of Pier 9 and at the upstream nose of both Piers 9 and 10.
- (C) Several vertical hairline cracks were observed extending from the top of the web wall to the waterline on the east face of Pier 9 and on both the east and west faces of Pier 10. In addition, a 1/8 inch wide vertical crack was observed extending from the top of the webwall to the waterline on the west face of Pier 9.

RECOMMENDATIONS:

- (A) Monitor the timber debris at Pier 9 and 10, and if found to be increasing in the future, removal operations may become warranted.
- (B) Monitor the footing exposure at Pier 9 during future underwater inspections. The scour evaluation indicates that the pier foundations are stable for the calculated scour conditions.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

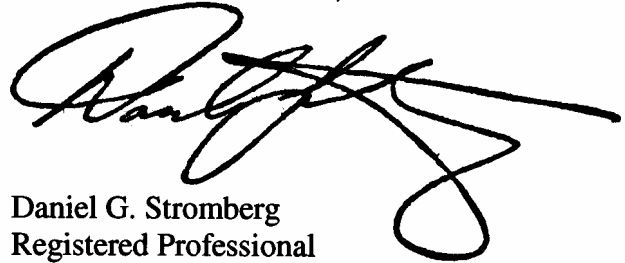
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27549

Feature Crossed: Mississippi River

Feature Carried: 42nd Avenue

Location: District 5 - Hennepin County, City of Minneapolis

Bridge Description: The superstructure consists of a ten span continuous steel girder structure supporting a reinforced concrete deck. The superstructure is supported by 11 reinforced concrete piers and two reinforced concrete abutments, all founded on piles. The piers in the water are numbered 9 and 10 from west to east according to the 1976 plans.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 30, 2007

Weather Conditions: Sunny, 68°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 9 and 10.

General Shape: The piers consist of two rectangular columns supporting a hammerhead pier cap. The columns are connected by a concrete webwall and are supported by rectangular concrete footings and seals that are founded on steel piles.

Maximum Water Depth at Substructure Inspected: Approximately 10.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the webwall at the south end of Pier 9.

Water Surface: The waterline was approximately 4.1 feet below reference.
Waterline Elevation = 798.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code N/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



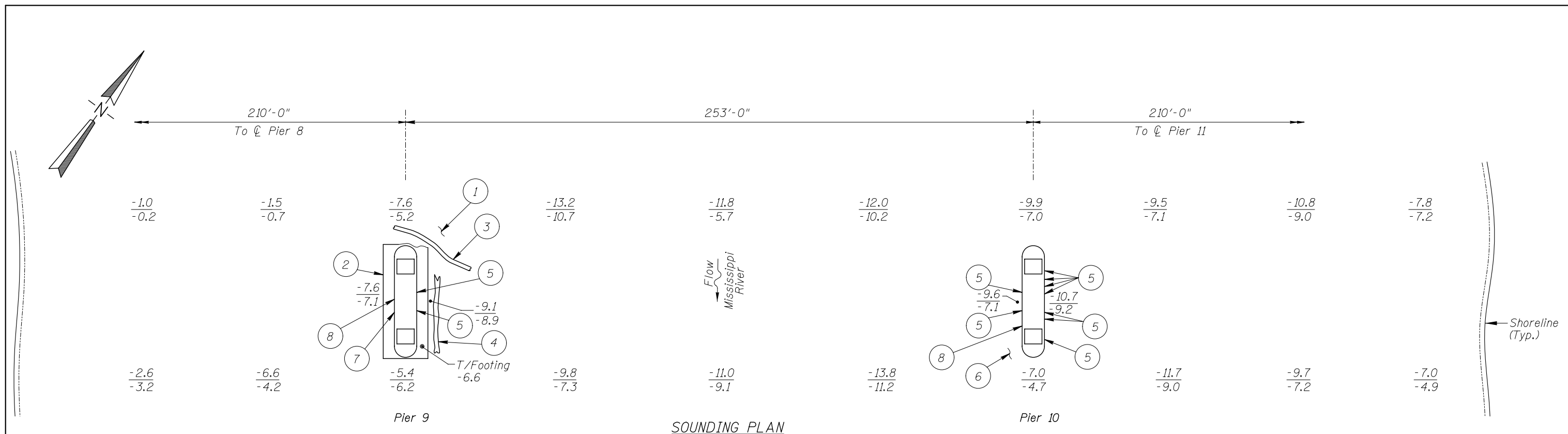
Photograph 1. Overall View of Structure, Looking North.



Photograph 2. View of Pier 9, Looking Northwest.



Photograph 3. View of Pier 10, Looking Southeast.



SOUNDING PLAN

INSPECTION NOTES:

- 1 The channel bottom material around Pier 9 consisted of riprap up to 1 foot in diameter at the upstream nose and sand infilling around the rest of the pier that had up to 1.5 foot of probe rod penetration.
- 2 The top of the footing around the entire perimeter of Pier 9 was exposed with vertical face exposures of 1 foot at the upstream west corner, 4 inches at the downstream west corner, and a maximum of 2.5 feet along the east face.
- 3 An 18 inch diameter log was observed on the channel bottom at the upstream end of Pier 9.
- 4 A log that was 18 inches in diameter and 30 feet long was observed on the channel bottom along the east face of Pier 9.
- 5 A vertical hairline crack was observed extending from the top of the webwall to the waterline.
- 6 The channel bottom material around of Pier 10 consisted of 1 to 3 foot diameter riprap with sand infilling that had up to 8 inches of probe rod penetration.
- 7 A vertical crack that was up to 1/8 inches wide was observed extending from the top of the webwall to the waterline.
- 8 Overall concrete on Piers 9 and 10 was smooth and sound with some random minor poor consolidation with 1/4 inch maximum penetration.

GENERAL NOTES:

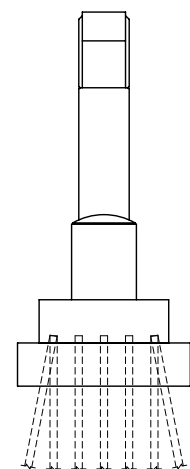
- 1 Piers 9 and 10 were inspected underwater.
- 2 At the time of inspection on August 30, 2007 the waterline was located approximately 4.1 feet below the top of the webwall at the downstream end of Pier 9. This corresponds with a waterline elevation of 798.4.
- 3 Soundings indicate the water depth at the time of inspection and are measured in feet.
- 4 Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

Note:

All soundings based on 2007 waterline location.

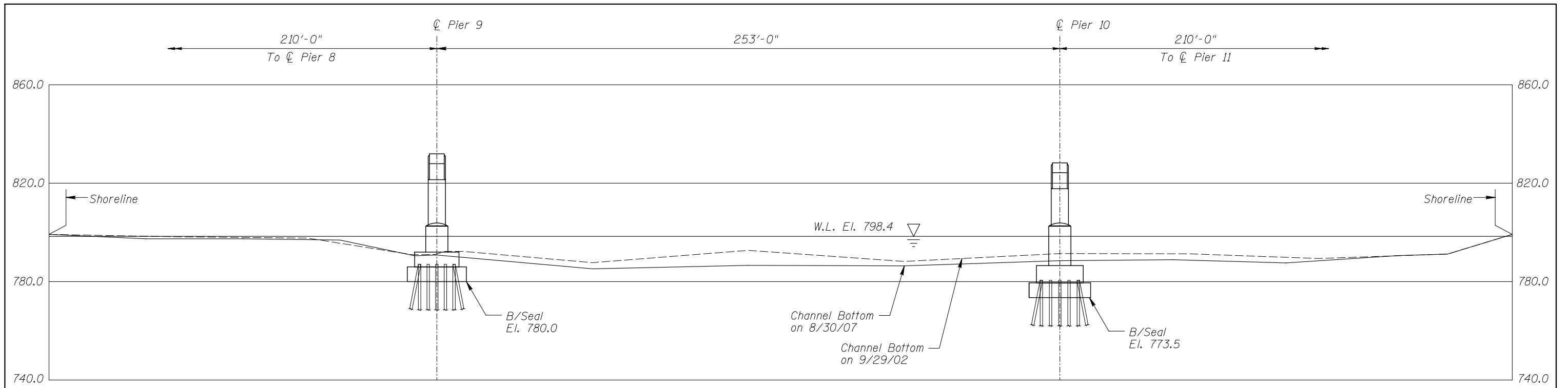
Legend

-6.0 Sounding Depth (8/30/07)
-6.7 Sounding Depth (9/29/02)

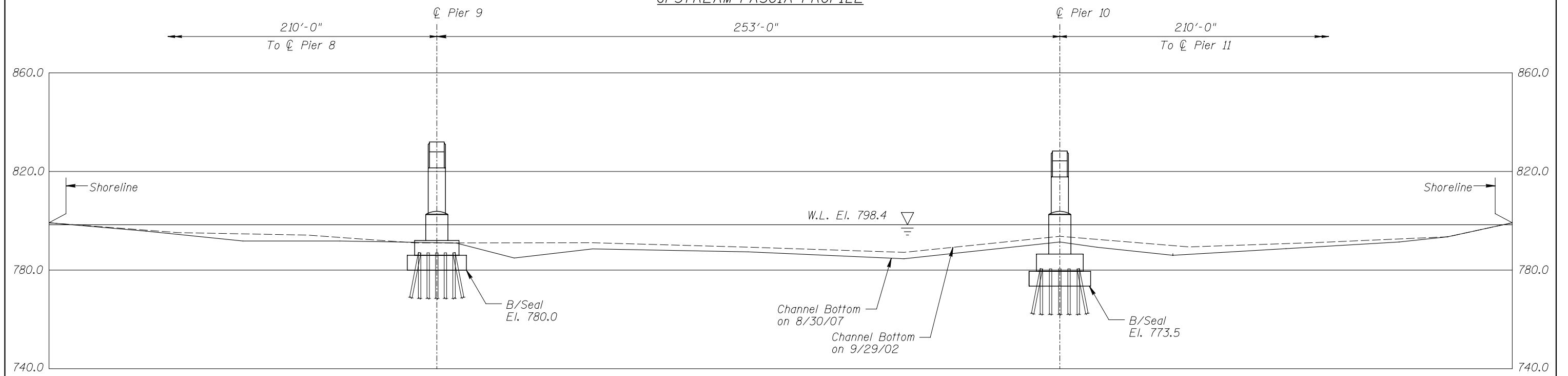


TYPICAL END VIEW OF PIERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27549 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS		
INSPECTION AND SOUNDING PLAN		
Drawn By: RR	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUG. 2007
Checked By: MDK		Scale: NTS
Code: 5221017A		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27549 OVER THE MISSISSIPPI RIVER DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: RR	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUG. 2007
Checked By: MDK		Scale: 1"=40'
Code: 5221017A		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 30, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 27549 WEATHER: Sunny, 68°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: ☒ SCUBA ☐ SURFACE SUPPLIED AIR
☐ OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Probe Rod, Boat, Camera

TIME IN WATER: 4:00 p.m.

TIME OUT OF WATER: 4:30 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s

VISIBILITY 0.5 feet

DEPTH 10.7 feet maximum at Pier 10

ELEMENTS INSPECTED: Piers 9 and 10

REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. Above water, vertical hairline to 1/8 inch wide cracks were observed in random locations on both piers. The footing at Pier 9 was exposed around the entire pier with a maximum vertical face exposure of 2.5 feet along the east face. Timber debris was observed at the upstream noses of both piers and along the east face of Pier 9 and consisted of 18 inch diameter and smaller logs and branches.

FURTHER ACTION NEEDED: ☐ YES ☒ NO

Monitor the timber debris at Pier 9 and 10, and if found to be increasing in the future, removal operations may become warranted.

Monitor the footing exposure at Pier 9 during future underwater inspections. The scour evaluation indicates pier foundations are stable for the calculated scour conditions.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27549
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Mississippi River

INSPECTION DATE August 30, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 9	7.6'	N	7	7	9	N	7	7	N	N	6	6	7	N	N	N	N	N
	Pier 10	10.7'	N	7	N	9	N	7	8	N	N	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete below water was in good condition with no structurally significant defects observed. Above water, vertical hairline to 1/8 inch wide cracks were observed in random locations on both piers. The footing at Pier 9 was exposed around the entire pier with a maximum vertical face exposure of 2.5 feet along the east face. Timber debris was observed at the upstream noses of both piers and along the east face of Pier 9 and consisted of 18 inch diameter and smaller logs and branches.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.